

Soil Remediation for Lead (Pb) Contaminated Parks in Durham

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This project, created by Louisa Belk and Wendy Katua, Duke MEM graduate students, in partnership with Toxic Free NC, aims to bridge information and engagement gaps surrounding lead contamination and options for remediation in Durham parks and to empower communities to participate in informed decision-making about the future of their parks.

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History & Background

Bihari's Discovery & Results

- In 2022, a Duke master's student, Enikoe Bihari, discovered that Walltown, East End, East Durham, and Lyon parks were historically waste incinerator sites.
- Bihari conducted a research study that uncovered [legacy lead \(Pb\) contamination](#) in these three parks: Walltown, East End, and East Durham parks. She found the lead levels were elevated above both geologic background levels and several EPA hazard thresholds, especially in some highly-trafficked areas.
- The parks had lead levels ranging from 8 to 2,342 ppm, with an average soil sample of 201 ppm, which already exceeded the EPA's safe gardening threshold. The situation was most severe at East Durham Park, where the average was 405 ppm, and a major hotspot in the southeastern portion of the park registered between 694 and 2,342 ppm levels
- The EPA has established clear thresholds for what counts as dangerous levels of lead in soil:
 - Anything below 30 ppm is considered a natural level
 - Below 100 ppm is considered safe for gardening
 - Below 400 ppm is considered safe for residential play areas
 - Below 1,200 ppm is considered safe for residential non-play areas
- She suggested further sampling of Lyon Park, which was also a historic waste incinerator site but was left out of their study due to time constraints, and Northgate Park, which received ash and cinders as fill from the previously named historic incinerators sites

What is Lead?

- Lead (Pb) is a toxic heavy metal and widespread environmental contaminant that does not break down in soil, meaning it persists over time
- It has been widely used in paint, gasoline, pipes, and industrial products, leading to long-term contamination in soils and urban environments

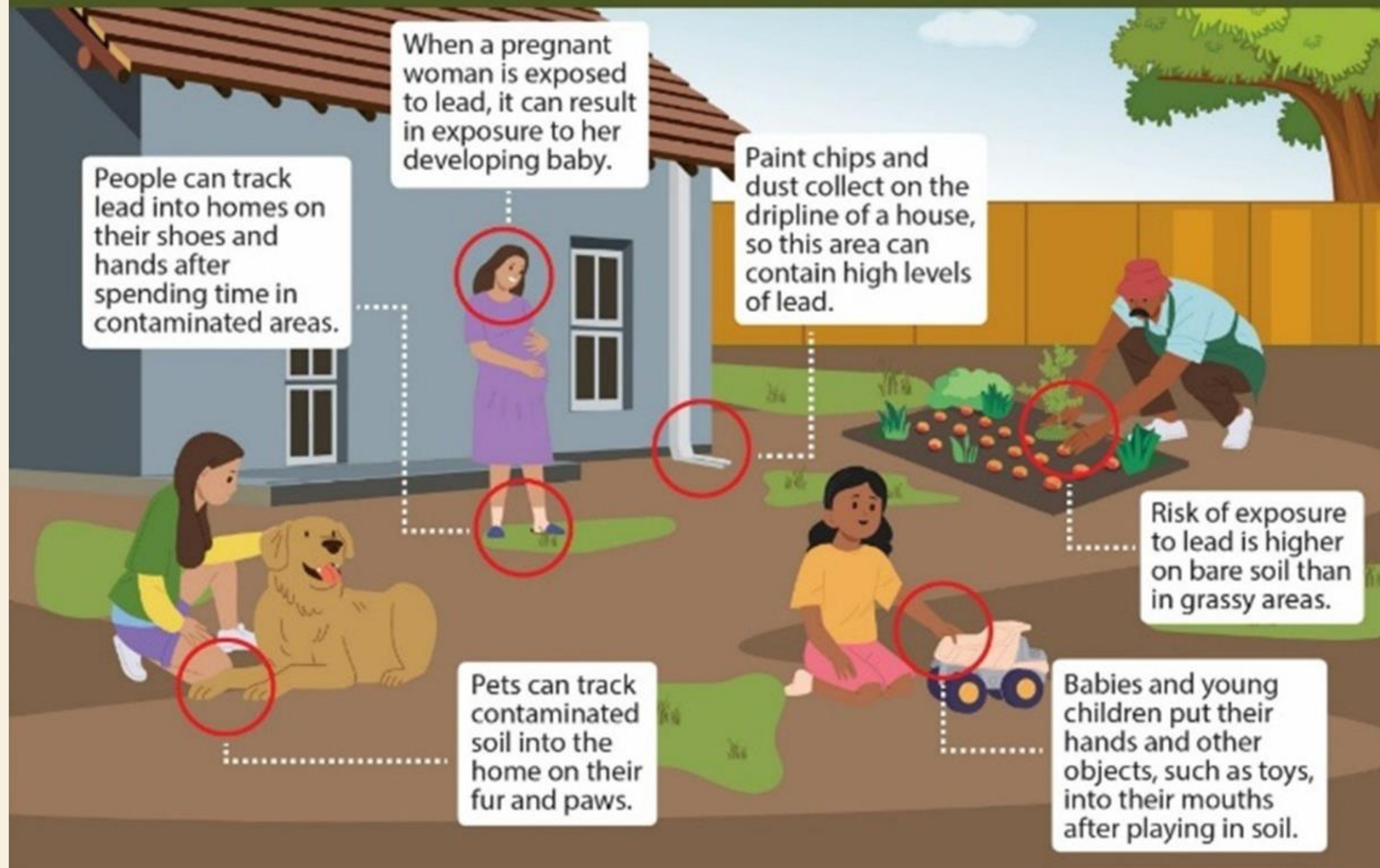
How Are People Exposed to Lead?

- **Ingestion** (most common): Hand-to-mouth contact (consumption) with contaminated soil, dust, or food/water
- **Inhalation**: Breathing in contaminated dust or air particles
- **Dermal contact** (less common): Skin contact with contaminated soil or dust
- Children are more vulnerable and more likely to be exposed due to hand-to-mouth behaviors and higher absorption rates

Health impacts of Lead

- Lead is a neurotoxin that affects multiple body systems and accumulates in the body over time
- **Children**: Brain and nervous system damage, lowered IQ, learning and behavioral challenges
- **Adults**: Cardiovascular effects, kidney damage, reproductive issues, and neurological problems
- No safe level of lead exposure has been identified, especially for children

How Can I Be Exposed to Lead?





1900s-1940s

*Operation of Municipal Incinerators

1950s

*Conversion to Public Parks

2022

*Duke Student Publishes Report

2023

*Public Discovery by Walltown Resident

*City fenced off and restricted access at 400 ppm

*City hires MAA, soil samples were collected in all 5 parks

*Walltown Community Association sends letter to City and Duke with requests

*All 5 parks added to NCDEQ Pre-Regulatory Landfill Program,

*Additional contaminated areas identified Northgate and Lyon Park

2024

*EPA lowered lead screening level to 200 ppm for areas where children live & play

*S&ME engineering firm scheduled to visit all sites in April to assess restricted areas and recommend next steps

*Waste delineation begins & is completed

2025

*Waste delineation reports were released for all five parks

*Trenching conducted to map depth and boundaries of buried waste

*Playground soil testing results released

*No elevated levels of other contaminants were detected above risk thresholds

*NCDEQ updates community, Planned solution: cap & cover (12" soil + restrictions)

**2026
(Current Status)**

*Currently waiting for Remedial Action Reports from NCDEQ

*DPR plans to host open house engagement sessions and help the community learn about each summart report

Current Status

NCDEQ Pre-Regulatory Landfill Program

A **pre-regulatory landfill** is defined as any land area, whether publicly or privately owned, on which municipal solid waste disposal occurred prior to January 1, 1983, but not thereafter, and does not include any landfill used primarily for the disposal of industrial solid waste. **The pre-regulatory landfill program**, run by DEQ under the Division of Waste Management program, is a risk-based program and relies on isolating exposure to the waste by covering the delineated waste footprint with 12 inches of clean soil and recording perpetual land use restrictions along with a notice of environmental contamination or notice of restricted use.

Remedial Action Report

Currently, NCDEQ is finalizing risk calculations in order to create a Remedial Action Report for the city of Durham - Durham Parks & Recreation (DPR) - that will outline proposed cap and cover remedies, which will vary depending on each park's environmental factors and risk results. From there, outreach meetings will be conducted to obtain community input.

Soil Remediation

Soil Remediation

Definition: Soil remediation is the process of cleaning up or reducing harmful contaminants in soil to make an area safer for people and the environment.

In-Situ: Treatment that happens in place. The contaminated soil stays in the ground while it is treated. These methods are generally less disruptive to the surrounding area.

Ex-Situ: Treatment that requires moving the contaminated soil, either to another location or off-site entirely. These methods involve more digging and disruption but can fully remove contamination from the area.

Cap and Cover

A protective barrier is built over contaminated soil to prevent people and plants from coming into contact with lead.

Chemical Stabilization

Amendments are mixed into soil to chemically bind to lead and make it harder for the body to absorb. Specifically, **Phosphate treatment** and **PLJ (plumbite jarosite)** are two examples of this approach.

Excavation

Contaminated soil is dug up and removed, then replaced with clean fill.

Cap and Cover

Cap and cover is a layered method that prevents exposure to waste by covering the delineated footprint. The cover, or “cap,” includes materials such as geotextile fabric, 12 inches of clean soil, vegetation, and drainage layers. It does not remove or destroy contamination but keeps it in place, reducing the spread of contaminants and limiting contact for people and wildlife.

Pros

- Reduced exposure to contamination (dermal + ingestion)
- Cost-effective
- Faster than excavation
- Allows continued use of open space
- Rain blocked from carrying contaminants into groundwater
- Prevents contaminated soil from being blown/washed away (erosion)
- Reduces the release of gases from buried waste

Cons

- Contamination remains underground (not removed, only isolated)
- Land use is restricted & must obtain prior approval from DEQ before redevelopment (limits future development)
- Requires long-term/consistent maintenance
- Damage to the cap can create future risks
- Vulnerable to erosion if not maintained
- Not impermeable (water can pass through)
- No trees

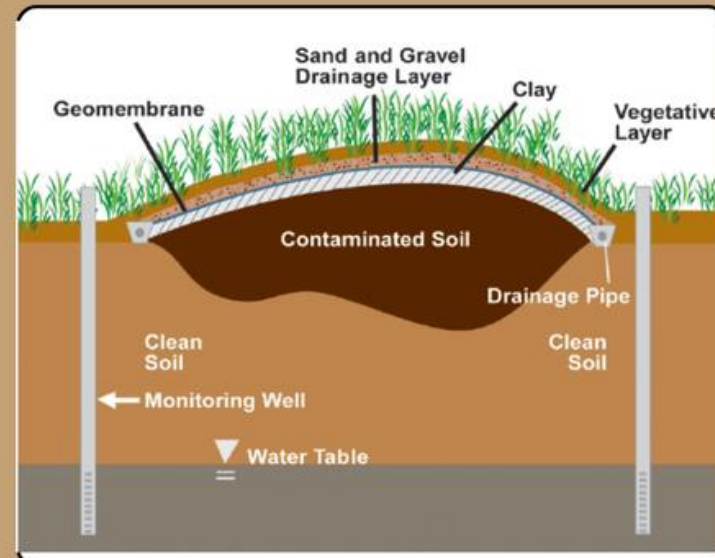
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The pre-regulatory landfill program, run by DEQ under the division of waste management, is risk-based and isolates exposure to the waste by covering the contaminated area with 12 inches of clean soil and recording perpetual land use restrictions, along with a notice of environmental contamination or notice of restricted use.

Currently, DEQ is finalizing risk calculations in order to create a **Remedial Action Report** for the city of Durham that will outline proposed remedies, which will vary depending on each park's environmental factors and risk results.



Process

- Clear site of trees, shrubs roots, and structures
- Grade and compact soil to prevent pooling and ensure runoff
- Remove or redistribute shallow contaminated soil (*12 inches, if needed*)
- Install geotextile fabric or liner over contaminated soil
- Add 6 inches of clay
- Add 6 inches of topsoil
- Add drainage and gas control layers (*if needed*)
- Add grass or shallow-rooted vegetation
- Install clear signage
- Maintain monitoring on an annual basis

Stabilize streams (*if needed*)

- Remove waste
- Regrade to stable slope (3:1 ratio)
- Install geocells
- Anchor on ground
- Fill with soil (6 inches clay, 6 inches topsoil)

Maintenance

The property owner is required to do an annual certification in addition to an annual DEQ inspection. Requirements include:

- Maintain 12-inch soil cover to prevent erosion and stabilize contamination
- Maintain vegetative cover
- No woody vegetation (trees)
- Maintain signage, fencing, and land use restrictions
- No subdivision of property

Impacts

Health

- Reduces exposure to contamination by creating a protective barrier
- 12 inches of clean soil + healthy vegetation cover (grass) reduces dermal (skin contact) and ingestion risk (hand-to-mouth consumption)

Time

Installing cap and cover can take anywhere from a few weeks to several months. The timeline will depend upon:

- Site complexity
- Presence of trees + structures
- Extent of contamination
- Stream stabilization needs

Cost

Cap and cover is generally more cost-effective than excavation. Costs will vary widely and can depend upon site complexity:

- Presence of trees + structures
- Extent of contamination
- On-site relocation vs. off-site removal
- Stream stabilization needs (can be basic, \$64 per cubic yard or hand-installed, \$750 per cubic yard)

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Cons

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- Land use is restricted & must obtain prior approval from DEQ before redevelopment (limits future development)
- Requires long-term/consistent maintenance
- Damage to the cap can create future risks
- Vulnerable to erosion if not maintained
- Not impermeable (water can pass through)
- No trees

Example: Freshkills Park in NYC is a former landfill sealed with layers of soil, geotextiles, and a plastic geomembrane that cover and stabilize waste, working alongside systems for drainage and gas collection. The site has been transformed into a public park with nature trails, open space, and restored habitats using shallow-rooted native vegetation. It shows how cap and cover can safely contain contamination while enabling land reuse, though it requires long-term monitoring and maintenance.

Excavation

Excavation is a remediation method that involves removing contaminated soil and waste from a site. The excavated material may be treated on-site, treated off-site, or disposed of in a hazardous waste landfill. After removal, the area is backfilled with clean soil.

Pros

- Removes contamination from the ground
- Reduces long-term risk
- Most protective long-term public health option
- Minimal maintenance once standards are met
- Allows unrestricted land use (e.g., playgrounds, gardens)

Cons

- Very expensive
- Disruptive, soil lot of heavy equipment
- Worker exposure to contaminated soil
- Community exposure to dust if not well controlled
- Loss of vegetation and soil structure
- Significant ecosystem disruption during clearing and excavation
- Requires a disposal site/landfill if is an ex-situ excavation
- Environmental Justice concerns (where will the soil be dumped)

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Process

- Test site: determine the extent of contamination
- Clear site: remove trees and surface features
- Excavate soil: often (6 inches to 1 foot)
- Continuous testing: excavate until safe levels are confirmed
- Place soil in trucks or on covered tarps and move off-site or treat on-site
- Dispose of at approved landfill (hazardous)
- Backfill area with clean soil
- Restore the site: The area is landscaped

Finances

Only cost-effective for small amounts of waste. Possible costs could include:

- Excavation
- Transport
- Disposal (especially hazardous waste)
- Clean replacement soil
- Site rebuilding after removal



Materials

- Excavators/backhoes
- Bulldozers
- Dump trucks (transport soil offsite)
- Plastic tarps and containers (store/cover soil)
- Dust/vapor suppression systems (e.g., foams, water misting)
- Water pumps (remove water when digging below water table)

Impacts

Health:

- Worker exposure to contaminated soil
- Dust and particulate matter are spread during excavation if not properly controlled (controlled with water spraying)

Worker safety:

- Workers must be HAZWOPER certified

Future Land Use

- No land use restrictions
- Land can be fully restored
- Allows use for playgrounds, gardens, and other amenities

Timeline

- Longer than cap and cover
- Timeline varies widely & is hard to predict

Depends on...

- Size and depth of contamination
- Contamination levels
- Amount of rock/debris present
- Whether buildings or other site activities limit equipment movement
- Distance to treatment/disposal facilities

Pros

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Example of a Hybrid Approach (Excavation & Cap and Cover): Bingham Park remediation in Greensboro, NC uses a hybrid approach. Contaminated soil (including lead) will be excavated from certain areas and transported offsite to the Great Oak Landfill. Other waste will be relocated and contained onsite under a cap and cover system. The project will be completed in phases to manage erosion and sediment.

Chemical Stabilization: Phosphate-Based Treatment

Phosphate-based treatment makes lead in contaminated soil safe without digging it up. Phosphate is added to the soil, where it reacts with lead to form a stable mineral called pyromorphite. Pyromorphite is a form of lead that your body cannot absorb: if soil is accidentally swallowed, it simply passes through. The total amount of lead in the soil stays the same, but the lead that remains is mostly in a form that can no longer harm you, bringing exposure risk down well below the safety level of 200 parts per million (ppm) set by the EPA.

Pros

- **The soil stays in place.** No digging, no trucks, no noise, no disruption to the park or neighborhood
- **Much less expensive than excavation**
- **Phosphate-based treatment has been researched and tested for over 25 years.** More is known about it than almost any other chemical approach for lead in soil
- **The phosphate used is a common fertilizer.** It supports plant growth and is generally considered safe when applied correctly.
- **Reduces lead exposure to below the EPA safety threshold**
- **Less disruptive to the community.** No heavy equipment, minimal dust and erosion of park space during treatment

Cons

- **Efficacy varies widely.** Results range from about 10 to 40% reduction in harmful lead, depending on soil conditions and how the treatment is applied.
- **It takes about a year** before most of the benefit is realized.
- **Lead stays in the soil.** The total amount of lead does not go down, only its form changes. **Flooding can also disturb treated soil** and move lead to new areas, so vegetative cover should be maintained
- **Overapplication can harm water quality.** Too much phosphate can run off into nearby streams or ponds.
- **Not suitable if arsenic is also present** without careful assessment first.
- **Phosphate may react with other soil materials** before reaching the lead, reducing effectiveness.

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Materials

- **Phosphate fertilizer:** common forms include triple superphosphate (TSP), phosphoric acid, hydroxyapatite, or phosphate rock
- **Sulfur:** helps lower the soil's acidity so the reaction works properly
- **Water:** the soil needs to be moist enough for the reaction to occur
- **Grass and vegetation:** planted after treatment to protect the soil



Process

- **Check for arsenic levels.** Phosphate can make high levels of arsenic more harmful, so the soil must be tested for arsenic levels before treatment. In Durham's parks, arsenic levels may be low enough that phosphate remains a safe option.
- **Hydrate the soil.** The soil must have enough moisture for the lead and phosphate to react.
- **Spread the amendments.** Phosphate fertilizer and sulfur are applied to the soil surface at the same time. The sulfur lowers the soil's acidity to the level where the reaction works best.
- **Mix into the soil.** Both materials are mixed into the soil after spreading.
- **Plant vegetation.** Grass is planted to hold the soil in place and prevent dust.
- **Wait.** Lead converts to pyromorphite over several months to about a year. No repeat treatments needed.

Current Status

Phosphate-based treatment has been researched and tested for over 25 years. A 16-year study in Joplin, Missouri found that different phosphate treatments reduced the amount of lead absorbed by the body by 32 to 74%. Research is ongoing, including work by Tyler Sowers, Ph.D. at the U.S. EPA in North Carolina.

Impacts

Finances

- Much less expensive than digging up and replacing contaminated soil
- An exact cost for large-scale park applications is not yet confirmed

Timeline

- Lead converts to its safer form over several months to about one year, no repeat treatments needed

Health

- This treatment does not make the soil completely hazard-free, but it significantly reduces the risk of lead entering your bloodstream.
- Good hygiene still matters after treatment: wash hands after being outside, especially for children. Keep dirty hands and fingers away from mouths.

Future Land Use

- No major restrictions on how the land can be used after treatment, trees can be planted
- For gardening, raised beds filled with clean soil are recommended as an extra precaution, to keep plants from reaching the treated soil below
- Bare soil should be kept covered with grass, mulch, or hard surfaces

Pros

- **The soil stays in place.** No digging, no trucks, no noise, no disruption to the park or neighborhood
- **Much less expensive than excavation**
- **Phosphate-based treatment has been researched and tested for over 25 years.** More is known about it than almost any other chemical approach for lead in soil
- **The phosphate used is a common fertilizer.** It supports plant growth and is generally considered safe when applied correctly.
- **Reduces lead exposure to below the EPA safety threshold**
- **Less disruptive to the community.** No heavy equipment, minimal dust and erosion of park space during treatment

Cons

- **Efficacy varies widely.** Results range from about 10 to 40% reduction in harmful lead, depending on soil conditions and how the treatment is applied.
- **It takes about a year** before most of the benefit is realized.
- **Lead stays in the soil.** The total amount of lead does not go down, only its form changes. **Flooding can also disturb treated soil** and move lead to new areas, so vegetative cover should be maintained
- **Overapplication can harm water quality.** Too much phosphate can run off into nearby streams or ponds.
- **Not suitable if arsenic is also present** without careful assessment first.
- **Phosphate may react with other soil materials** before reaching the lead, reducing effectiveness.

Chemical: (PLJ) Plumbojarosite Treatment

Plumbojarosite (PLJ) is a new and promising way to make lead in contaminated soil safer, without digging it up. Special materials are added to the soil that cause the lead to convert into a stable mineral called plumbojarosite. Like pyromorphite, PLJ cannot be absorbed by the body. If soil is accidentally swallowed, the lead passes through. This method has reduced harmful lead to less than 1%, far beyond what other approaches have achieved. It can also treat arsenic at the same time, which is rare for Pb soil remediation options.

Pros

- **The soil stays in place.** No digging, no trucks, no noise, no disruption to the park or neighborhood
- **Much less expensive than excavation**
- **Extremely effective.** Reduces harmful lead to less than 1%, far beyond what other methods have achieved
- **Works fast.** Conversion happens in about 16 hours
- Can **treat both lead and arsenic at the same time**, which most remediation methods cannot do
- **No extreme heat needed**, making it practical for real-world use

Cons

- **Still in the research phase.** This method has only been tested in laboratories and small controlled settings, not yet at full scale in a real park or community
- **Flooding could technically disturb treated soil** and move lead to new areas. Vegetative cover and erosion controls help minimize this risk and should be maintained over time.
- **Total lead remains in the soil, only its harmful form changes**

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Materials

- **Potassium (K)-jarosite:** the seed mineral that starts the conversion process
- **Ferric sulfate and sulfuric acid:** the chemical solution that works with the seed mineral to form PLJ
- **Lime:** added after treatment to balance the soil's acidity
- **Grass and vegetation:** planted to protect the soil after treatment

Process

- **Add the treatment materials.** A chemical solution and a seed mineral are mixed into the contaminated soil. Together they cause the lead to convert into PLJ.
- **Let the reaction happen.** Conversion takes about 16 hours. Treatment works best at warmer temperatures, so summer months are ideal.
- **Correct the soil's acidity.** The treatment makes the soil more acidic, so lime is added afterward to restore balance. This does not undo the treatment.
- **Plant vegetation.** Grass is planted to hold the soil in place and prevent dust.



Current Status

PLJ is one of the most promising new tools in lead remediation. The U.S. EPA is currently scaling this method up for field trials. While results so far have been remarkable, it is important to know that this treatment is still in the testing phase. Real-world application in parks and neighborhoods is the next step.

Impacts

Cost

- Estimated at approximately \$2 per gallon at scale
- Significantly less than the cost of digging up and replacing contaminated soil

Health

- This method reduces harmful lead to less than 1%, significantly lowering the risk of lead entering your body
- It can also reduce arsenic exposure at the same time, which most other remediation methods cannot do
- Good hygiene still matters after treatment: wash hands after being outside, especially for children. Keep dirty hands and fingers away from mouths.

Future Land Use

- No major restrictions on how the land can be used after treatment
- Grass grows successfully after treatment
- Trees may require some precautions during treatment but normal conditions are restored quickly afterward

Timeline

- Rapid: conversion can happen in about 16 hours

Pros

- **The soil stays in place.** No digging, no trucks, no noise, no disruption to the park or neighborhood
- **Much less expensive than excavation**
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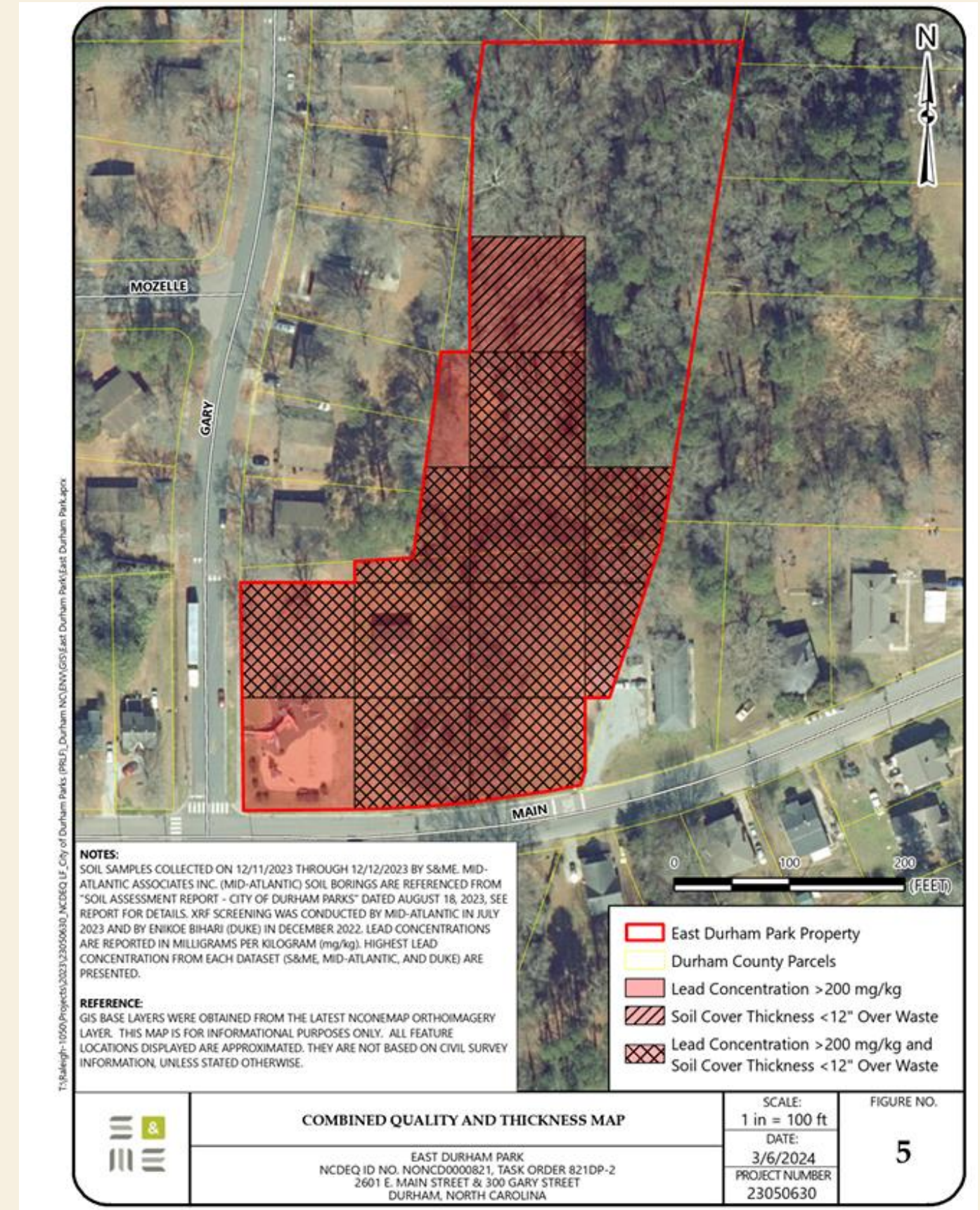
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- **Total lead remains in the soil, only its harmful form changes**

Specifics of Each Park

East Durham Park

- **Environment**
 - East Durham Park sits on 9.01 acres of land
 - 1.10 ha forest (75% of park)
 - Native hardwoods with some invasive species
- **Contamination Results**
 - Soil lead (Pb): 28–2342 ppm (mean: 405 ppm; median: 107 ppm)
 - Major hotspot (694–2342 ppm) in the southeast near the residential area (play, garden use)
- **Community Concerns**
 - Presence of a Creek that could spread contamination via runoff
 - 5 nearby schools → risk to children
- **Future / Short-Term Actions**
 - NCDEQ is currently working to confirm/deny whether East Durham Park is within a Water Supply Watershed (WSW). The site includes two wells



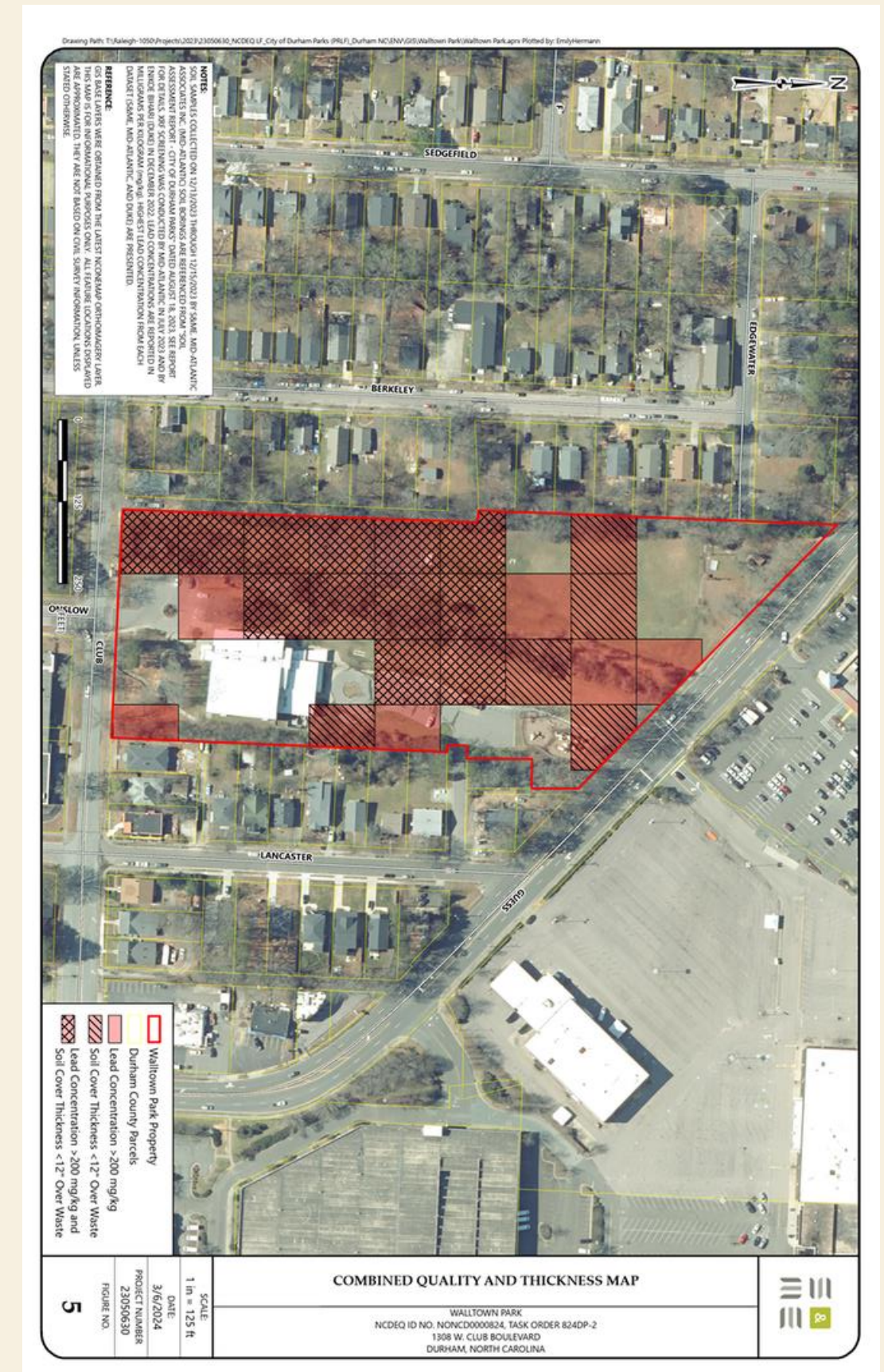
East End Park

- **Environment**
 - East End Park sits on 9.46 acres of land
 - 1.38 ha of forest cover (44% of total area)
 - Dominated by 9 native hardwood trees and invasive plants, with some native pines present
- **Contamination Results**
 - Soil lead (Pb): Ranged from 8 to 1364 ppm (mean: 127 ppm; median: 57 ppm)
 - Major hotspot: The southern region of the park, behind a fence with a locked gate
- **Community Concerns**
 - The major hotspot area lacks much vegetative cover and contaminated surface soil particles can be easily eroded by wind and water into the neighboring environment.
- **Future / Short-Term Actions**
 - NCDEQ is currently working to confirm/deny whether East End Park is within a Water Supply Watershed (WSW). The site includes three wells



Walltown Park

- **Environment**
 - The Walltown Park covers 7.9 acres of land
 - 1.06 ha of forest cover (42% of its total area)
- **Contamination Results**
 - Soil lead (Pb): Ranged from 13 to 1338 ppm (mean of 162 ppm, and a median of 105 ppm)
 - Major hotspot: Hotspots spread out along the north-south through the middle of the park. Additionally, some of the grassy areas near the basketball courts and horseshoe pits had elevated Pb.
- **Community Concerns**
 - Community housing directly borders the park on two sides
 - Orange fencing repeatedly falls down and signage disappears for months, creating ongoing exposure risks
- **Future / Short-Term Actions**
 - NCDEQ is currently working to confirm/deny whether Walltown Park is within a Water Supply Watershed (WSW). The site includes one well



Lyon Park

- **Environment**
 - Lyon Park sits on 12.23 acres of land
- **Contamination Results**
 - Soil lead (Pb): Ranged from 5 to 394 ppm based on field screening (primary sample: 384 ppm; deeper sample: 248 ppm)
 - Major hotspot: Isolated elevated Pb along the eastern boundary near the former off-site incinerator property (away from main recreation areas)
- **Future / Short-Term Actions**
 - NCDEQ is currently working to confirm/deny whether Lyon Park is within a Water Supply Watershed (WSW). The site includes two wells
 - Residents may also use nearby facilities, including the CFLRC at Lyon Park, Orchard Park (1000 S Duke Street), and Forest Hills Park (1639 University Drive



Northgate Park

- **Environment**
 - Northgate Park sits on 31 acres of land
- **Contamination Results**
 - Soil lead (Pb): Ranged from 6 to 357 ppm based on field screening values, with most concentrations between 20 and 100 ppm
 - Major hotspot: Pb concentrations (200–357 ppm) scattered across the park, with no single dominant hotspot area
- **Future / Short-Term Actions**
 - NCDEQ is currently working to confirm/deny whether Northgate Park is within a Water Supply Watershed (WSW). The site includes fourteen wells



Engagement & Outreach

OUTREACH PLAN

CITY FEEDBACK

- Provide resources: published reports, engagement calendars, and any relevant project materials
- Accommodations: Spanish translation, learning styles, ADA accessibility, visual appealing
- Improve community feedback practices
- In-person & virtual engagement: Open house sessions, soil workshops, and town hall meetings to provide provide specialized knowledge access with DPR and DEQ and address any lingering questions
- Specified outreach and information provided for each particular Durham park at in-person events

The information above came from meeting with DPR

COMMUNITY FEEDBACK

- Voices being diluted due to demographic changes - different parks have different priorities
- Moving waste to already burdened areas
- Barriers to understanding due to complex technical and financial information
- Time delays (years without action) - Loss of momentum: No visible progress, No clear updates
- Community input is not meaningfully influencing decisions

The information above came from meeting with community and coalition members

OUTREACH PLAN

RECOMMENDATIONS

INFORM & EMPOWER

- Use an open format where community members can move through topics, ask questions, and learn at their own pace.
- Clear and consistent communication and engagement
- Community-friendly simple summary materials
- Defined timeline for remediation & transparent explanation of risks and remediation plans
- All information must be translated in Spanish
- Multiple engagement avenues (in-person and online)
 - Door-to-door canvassing
 - Workshops with city leadership
 - Coalition building across parks
 - Social media updates
 - Newsletters
 - Dedicated webpage
 - Regular updates + easy-to-access information
 - One-on-one conversations (phone calls)

CONSULT & INVOLVE

- Ensure in-person meeting opportunities to allow for immediate questions and help improve understanding
- Dedicated feedback time provided in community meetings
 - Meaningful two-way dialogue (collaboration):
 - Community input is weighed equally with government decisions
- Prioritize input from historically marginalized communities
- Survey the main concerns of the community and directly address those concerns
- Accommodate different community preferences for different parks

COLLABORATE

- Work with community coalitions

Current DPR Outreach & Engagement Plan

- Provide resources: published reports, engagement calendars, and any relevant project materials on their website
- Accommodations: Spanish translation, learning styles, ADA accessibility, visual appealing
- Improve community feedback practices
- In-person & virtual engagement: Open house sessions, soil workshops, and town hall meetings to provide provide specialized knowledge access with DPR and DEQ and address any lingering questions
- Specified outreach and information provided for each particular Durham park at in-person events

****The information above came from meeting with DPR***

Concerns & Desires of Community

- Voices being diluted due to demographic changes - different parks have different priorities
- Moving waste to already burdened areas
- Barriers to understanding due to complex technical and financial information
- Time delays (years without action) - Loss of momentum: No visible progress, No clear updates
- Community input is not meaningfully influencing decisions

****The information above came from meeting with community and coalition members***

Suggestions

- **INFORM & EMPOWER**

- Use an open format where community members can move through topics, ask questions, and learn at their own pace.
- Community-friendly simple summary materials
- Defined timeline for remediation & transparent explanation of risks and remediation plans
- All information must be translated in Spanish
- Multiple engagement avenues (in-person and online)

- **CONSULT & INVOLVE**

- Ensure in-person meeting opportunities to allow for immediate questions and help improve understanding
- Dedicated feedback time provided in community meetings
- Meaningful two-way dialogue (collaboration):
- Community input is weighed equally with government decisions
- Prioritize input from historically marginalized communities
- Survey the main concerns of the community and directly address those concerns
- Accommodate different community preferences for different parks

- **COLLABORATE**

- Work with community coalitions

Questions?

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Feedback?

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